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Feature-marking in the L2 development of deverbal compounds[1]

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This study focuses on the development of complex word formation in L2 acquisition. We examine experimentally elicited data on English deverbal synthetic compounding (such as *toe-painter*) by native Spanish speakers and conclude that: (a) development proceeds in stages which clearly reflect UG-constrained L1 influence; (b) nontargetlike productions (e.g. *painter-toes*) show attempts to spell out the grammatical features associated with functional categories in deverbal compounding; though nontargetlike, they are nonetheless consistent with the compound's required feature-marking; (c) such attempts implicate the early existence in the Interlanguage of those functional heads and their projections in the (lexical) syntax; i.e., the absence of the correct phonological form cannot be taken to imply lack of knowledge of morphosyntactic features and their corresponding phrase structure.

1. Introduction

The goal of much recent research in nonnative language (L2) acquisition is to analyze Interlanguage data by using independently motivated principles and parameters of Universal Grammar (UG), as carried over from the native language (L1) or as instantiated in other final-state grammars. Within this research strategy, as in studies of L1 acquisition, the absence of a match between the developing Interlanguage and the target with respect to various linguistic phenomena has led researchers to propose intermediate 'grammars'

[1] Earlier versions of this paper were presented at Second Language Research Forum, Concordia and McGill Universities (6–9 October 1994) and the Boston University Conference on Language Development (4–6 November 1994). We are indebted to members of the NorthEast Language Acquisition Group (NELAG) for their constructive criticisms and help: Roger Maylor, Ianthi Tsimpli, Martha Young-Scholten, and especially Ute Bohnacker, Belma Haznedar, Isa Muxí, Bernadette Plunkett and Dan Robertson. For discussion (as well as questions we can't yet answer) on a variety of aspects relevant to this paper, we thank: Bob Beard, Elena Benedicto, Hagit Borer, Héctor Campos, Joe Emonds, Lynn Eubank, S. J. Hannahs, Teun Hoekstra, Dawn MacLaughlin, Alec Marantz, Bill McClure, Silvina Montrul, Cathy O'Connor, Ian Roberts, Andy Spencer, Maggie Tallerman, Margaret Thomas and Lydia White. We alone are responsible for flaws and inaccuracies, however.

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to account for intermediate stages (see, for example, duPlessis, Solin, Travis & White 1987; Schwartz & Tomaselli 1990; Tsimpli & Roussou 1991; Hawkins, Towell & Bazergui 1993; Martohardjono & Gair 1993; Schwartz & Sprouse 1994; Vainikka & Young-Scholten 1994). Studies such as these have been concerned with sentential syntax, primarily word order. In this paper we extend this research strategy into a subphrasal domain, namely, that of productive deverbal compounding.

Word-formation is essentially an unexplored topic in L2 acquisition (see Clahsen 1991; Lardiere 1994, 1995 for some preliminary work) and thus there are two general goals of the present study: the first is to characterize the development of deverbal compounding in the Interlanguage of native Spanish speakers acquiring English; the second is to determine whether there are also intermediate 'grammars' in the acquisition of complex X^0-level constituents. More specifically, because the various morphological processes involved in deverbal compounding in both Spanish and English are tightly constrained, this study can provide insights into two new areas of L2 acquisition: (a) the ways in which such morphological processes operate; and (b) the way in which verbal (or in this case de-verbal) affixation is acquired and manipulated.

We will use these data to address an issue which has figured prominently in recent discussions in the L2 literature, namely, what counts as evidence for the acquisition of functional categories. We will conclude that certain Interlanguage compounding 'errors' are revealing in that they suggest that L2 acquirers (L2ers) do have knowledge of the deverbal feature-marking required in the compound, and they produce affixes which – although nontargetlike – are at least consistent with these features.

In Section 2 we outline our assumptions about productive synthetic compounding for both Spanish and English. Section 3 presents cross-sectional L2 data on the acquisition of these compounds in English by native Spanish speakers (Lardiere 1994). In section 4 we consider possible analyses for these data. We conclude in section 5 with discussion of the theoretical approach we adopt in our analysis.

2. Deverbal compounds in Spanish and English

2.1 *Overview*

Both Spanish and English have a regular process of forming deverbal compounds to coin a name for somebody/something that – oversimplifying somewhat – performs a transitive action on a (generic) object. Examples for both languages are given in (1). The first two examples have become lexicalized in each language, whereas the third represents a novel (but attested) coining (in Spanish):

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(1)	Spanish	English
(a)	un lavaplatos	a dishwasher
	un lav -a plato -s	
	a wash -3SG plate -PL	
	'a dishwasher'	
(b)	un abrelatas	a can-opener
	un abr -e lata -s	
	an open -3SG can -PL	
	'a can-opener'	
(c)	un pierdeplumas	a pen-loser
	un pierd -e pluma -s	
	a lose -3SG pen -PL	
	'a pen-loser'	

These forms in Spanish and English share several properties. In both languages they are deverbal nominalizations consisting of a head and its complement (usually the theme/direct object); in both, the 'nonhead' complement noun (for example, *platos*; *dish*) may not satisfy the external argument of the base verb (*lav-*; *wash*). Second, the entire compound refers to the person or implement which performs the action of the predicate. Third, they are highly productive in both languages – in Spanish this is the only type of fully productive compounding available (Harris 1987, Lang 1991), and spontaneous neologisms are usually semantically compositional. Fourth, as noted by DiSciullo (1992b), DPs are excluded from the internal structure, and the nonhead noun has no definite reference (on the latter, see Roeper 1987). Finally, DiSciullo has also argued that these compounds comprise 'complete functional complexes' in both languages, in that in addition to the internal argument, an external argument is satisfied: namely, by the *-er* suffix in English (see also Roeper 1987) and by the null-pronominal element *pro* in Italian (and Spanish). We return to this shortly.

There are also obvious differences in (1) between Spanish and English. Despite the fact that in sentential syntax VP is head-initial in both, only Spanish retains canonical verb-complement order in deverbal compounds. Additionally, unlike in English, the verb in the Spanish compound appears to bear 3SG features of verbal inflection and its object is nearly invariably pluralized, as in the examples in (1) above. We return to these issues below as well.

But first we briefly synthesize recent accounts of these compounds in Spanish and English. The most important feature common to these analyses is that, at least to some extent, syntactic mechanisms and especially the conventions of X-bar theory are assumed or allowed to extend into the formation of X^0-level compounds 'wherever they can apply' (DiSciullo 1992b). This position is in keeping with recent proposals, for example, by Hale & Keyser (1991, 1993a), Keyser & Roeper (1992) and Cinque (1993),

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that lexical structures are in fact constrained by established principles of syntax. The literature is divided as to whether synthetic compounding (the type investigated here, involving satisfaction of the argument structure of the base verb) takes place 'in the syntax' or 'in the lexicon' (see Spencer 1991 and Lardiere 1994 for many references). However, as the compounds we examine unquestionably exhibit the external distribution of heads, i.e. minimal projections, we follow Aronoff (1994: 14–15) in assuming that compounds are minimal projections with a lexeme-internal syntax in which the very same mechanisms as those found in supralexical syntax may be at work, and may or may not operate differently in each domain.[2]

2.2 *Spanish deverbal compounding*

For the Spanish deverbal compound, we propose – building on earlier work by DiSciullo (1992a, b, c) and following Lardiere (1994) – that the external argument of the base verb is a null subject, *pro*, licensed in the standard manner by Spec-Head agreement and identified by the inflectional features of the verb. In productive usage these are taken to be 3SG features of agreement. Such agreement can be seen especially for 3rd conjugation verbs where it is this inflected rather than stem form which enters into the formation of the compound, as shown in (2):[3]

(2) (a) abr**i**r
'to open'

[2] We set aside the contentious issue of whether the affixation processes in productive deverbal synthetic compounds should be classified as 'inflectional' or 'derivational', noting only that such compounding reflects aspects traditionally associated with both: i.e. X^0-level category change (derivational), on the one hand, and regularity, productivity, and semantic transparency (inflectional), on the other. Gerundive nominalizations (as in *eating* or *cookie-eating*) in general are usually categorized as an inflectional process despite the category change (see, for example, Chomsky 1970; Spencer 1991), and we note Fabb's (1984) characterization of productive *-er* nominalizations (as in *eater* or *cookie-eater*) as also inflectional. For discussion of some additional complications involved in drawing the inflectional-derivational distinction, see Drijkoningen (1992) and Aronoff (1994).

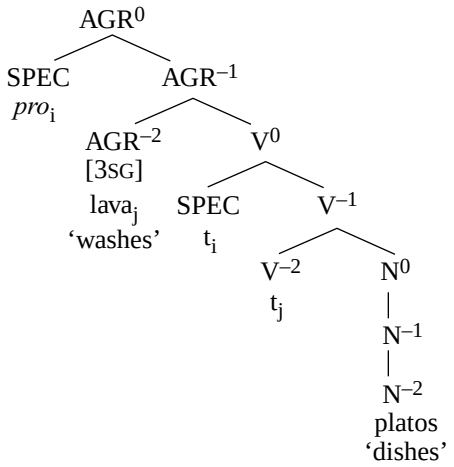
[3] Although the form of the verb in lexicalized Spanish deverbal compounds has sometimes been historically regarded as involving 2SG (imperative) inflection, current speakers do not have this intuition in novel productive usage. Spanish also apparently differs from Italian (the language DiSciullo investigated) with respect to 3rd conjugation verbs in compounds, in that the latter may retain the stem vowel *-i* as opposed to the 3SG inflected form (see (2)). Whether the analysis for Spanish presented here can be extended to Italian will therefore be left open, especially in light of the fact that this type of compounding is apparently more productive in Spanish than Italian. We also thank Héctor Campos for pointing out to us that 'defective' verbs in Spanish, such as *abolir* ('to abolish'), which lack 3SG present indicative forms, also cannot enter into deverbal compounding, for example, 'law-abolisher': **abole-leyes*; **abuele-leyes*. This supports the idea that the verb is indeed inflected in Spanish deverbal compounds; if it were the stem, the impossibility of the compound would be unexpected.

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(b) abr**e**
pro open-3SG
'he/she/it opens'
(c) abr**e**-latas
'can-opener'

Clearly, however (as also argued by DiSciullo), there is no Tense feature present in the compound. In this sense deverbal compounds are also similar to other syntactic deverbal nominalizations such as gerund and participle clauses (see, for example, Pollock 1989; Kornfilt 1991; Belletti 1992), as well as to nonfinite syntactic small clauses (for example, Chomsky 1993; Haegeman 1994), all analyzed as being headed by AGR. In short, deverbal nominalizations such as the compounds in question are lexical (i.e. X^0-level) analogues of syntactic AGRPs. The lack of Tense and of any kind of definite reference suggests the absence of compound-internal case assignment as well (as has often been suggested for X^0-level constituents, by Sproat 1985; Roeper 1988; Grimshaw 1990; DiSciullo 1992a, 1992c; Hale & Keyser 1993a among others). We therefore posit the representation in (3) for the deverbal compound in Spanish, in which a (caseless) null subject *pro* is licensed as the external argument via Spec-Head agreement and is identified by the [3SG] inflectional features of the verb. Note also that the nonhead complement noun is generic, which is spelled out via plural affixation.

(3) *Spanish deverbal compound*



lavaplatos ('dishwasher')

Because the compound's external distribution is X^0 – i.e. that of a syntactic head – we adopt the notation of Cinque (1993) (who somewhat modifies Selkirk 1982), in which negative integers represent X^0-internal structure, with

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X^0 the maximal projection. Since established principles of syntax (such as head-to-head movement) have been argued to constrain lexical derivation as well, we have shown both subject raising and verb raising – as in sentential syntax in Spanish – in (3) above.

2.3 *English deverbal compounding*

For English deverbal synthetic compounds, we assume an analysis closely related to earlier proposals by Roeper (1988) and Keyser & Roeper (1992). These proposals also posit a null external argument (PRO), as well as the incorporation of the object into the base verb in the deverbal nominalization process. Keyser & Roeper (1992), for example, argue that in English synthetic compound formation, there is syntactic head movement of the nonhead noun, claiming that such movement 'takes the form of incorporation' (p. 104). Since the lack of nominal inflection has been noted (by Anderson 1985, for example) to be a hallmark of incorporating processes, incorporation, moreover, could account for the well-known constraint against plurals in compounds in English, as also noted by Keyser & Roeper in the following examples (1992: 101 (38)):

(4) (a) peapicker
(b) *peaspicker
(c) ladykiller
(d) *ladieskiller

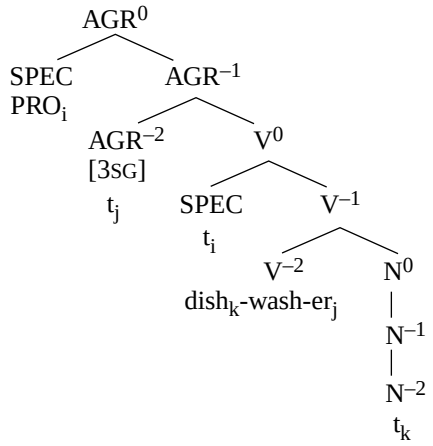
As with Spanish, this again leads to analyzing such compounds as a type of lexical AGR phrase, with the (de-)verbal affix *-er* specified for 3SG features of agreement. In the formation of the English compound – in contrast to what happens in Spanish – the verb does not raise.[4] Nevertheless, similar to Spanish, Spec-Head agreement holds between the external argument PRO (see also Marantz 1988/1989), and the features of *-er* (which must eventually

[4] This could be restated in Minimalist terms (Chomsky 1993) as feature-checking taking place after Spell-Out, i.e. as covert verb movement. Whether *-er*/*-ing* lowering or covert verb raising, our assumption is to follow the null hypothesis, namely that the operations applicable to verbs in sentential syntax apply equally to whatever extent possible in lexical derivation. We realize, as also pointed out by a reviewer, that overt verb raising would result in a descriptively equivalent analysis. As far as we can tell, there is no empirical way to decide between the two alternatives. Nevertheless, positing overt verb raising or the lack thereof needs some sort of motivation. Early proposals about the lack of overt verb raising in English attributed it to the inability of moved verbs to transmit theta roles (Pollock 1989), and one could appeal to that in the lexical domain as well. More current theories require there to be a reason for verbs to raise, for example, because of a strong feature or because a feature needs to be checked off prior to Spell-Out; again, as far as we can tell, no such reason exists in the English deverbal compound case. In sum, the null hypothesis provides us with at least some motivation, especially from a learnability standpoint, whereas the verb raising analysis has none. Therefore, we maintain that the analysis with no overt verb raising is the simplest assumption for the English deverbal compound.

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attach to the verb). The representation for the English deverbal compound is in (5):

(5) *English deverbal compound*



2.4 *Summary*

In sum, in both languages deverbal synthetic compounds are realized as complex X^0-level derivations, specifically AGR^0, whose head is always specified as [3SG].[5] The (null) external argument is licensed by Spec-Head agreement in both languages (and thus must raise to [Spec, AGR^0]). However, in English, unlike in Spanish, the object incorporates into the verb, resulting in the deletion of its plural inflection. As we shall see in the next section, it appears to be this last step in the English compounding process – the incorporation of the object and resultant plural deletion – which poses particular difficulty for the native-Spanish speakers acquiring English.[6]

[5] Following Sproat (1985), one might posit a 'nominalizing' feature in AGR^{-2} for Spanish and English deverbal compounds, or it might be that AGR is inherently nominal, as suggested by, for example, Chomsky (1981: 52); Hoekstra (1984); Platzack (1990). The (agentive) *-er* affix in English is also traditionally thought to bear a [+N] categorial feature and is often taken to be the head of the word to which it attaches (see for example, Williams 1981; Selkirk 1982; Lieber 1983; DiSciullo & Williams 1987).

[6] The issue of pluralization in compounds is extensively treated in Lardiere (1994, 1995). Pluralization of both regular (*hands-washer*) and irregular (*feet-washer*) objects in the compounds reported on in these studies was by far the most frequent 'error', extending even into the advanced level. See below, particularly fn. 14, for details of pluralization results relevant to this study.

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3. The L2 acquisition of deverbal compounding

3.1 *Method*

Lardiere (1994) elicited novel deverbal compounds from adult L2 acquirers of English. The study we report on here looked at deverbal synthetic compound production by 34 (adult) native Spanish speakers grouped by English L2 proficiency into three levels: low (n = 10), intermediate (n = 12) and advanced (n = 12).[7] Additionally, 12 adult native English speakers served as controls.

The task was similar in several respects to those of earlier experiments on the formation of deverbal compounds in English L1 acquisition by Clark & Hecht (1982), Gordon (1985) and Clark, Hecht & Mulford (1986). Subjects were presented with 16 shuffled cards, each card containing a drawing of a cartoon 'creature' acting in some way upon a set of objects; each subject, tested individually, was asked to make up a name for the creature based on the action being performed. For instance, a subject would be shown a picture of the creature painting someone else's toes (see Appendix A), asked to describe what the creature was doing in the picture, and then asked what name could be given to that creature based on what he/she was doing (*toe-painter*). The drawings were designed to elicit 8 regularly and 8 irregularly pluralized objects (such as *hands* and *feet*, respectively).[8] (For fuller procedural details, see Lardiere 1994.)[9]

3.2 *Results*

Unsurprisingly, 100% of the native controls' productions were as expected, namely, of the form OV-*er*, although a few responses were spontaneously self-corrected from the (equally correct) 'OV-*ing*-Agent' pattern (for example, from *toe-painting creature* to *toe-painter*). As for the L2 subjects, a total of 513 compounds were produced (544 were possible). The table in (6) summarizes their overall error rate out of total compounds produced. We will refer to these nontargetlike compounds as 'errorful compounds'; note, however, that this category of errorful compounds excludes errors of

[7] The L2ers were ESL students (age 18–35) whose proficiency was assessed on the basis of scores obtained on the Michigan Test of English Proficiency (Form B) plus independent evaluation of their writing samples by their teachers and/or program administrators.

[8] As the experimenter did not describe the picture, subjects were free to choose their own lexical items. The intended elicitations were: *fly-catcher*, *fly-eater*, *mouse-catcher*, *mouse-eater*, *baby-kisser*, *baby-hugger*, *child-kisser*, *child-hugger*, *hand-washer*, *hand-biter*, *foot-washer*, *foot-biter*, *toe-counter*, *toe-painter*, *tooth-counter*, *tooth-painter*.

[9] A second elicitation task (employing a methodology similar to that of the deverbal compound experiment) was also completed during the session, the goal of which was the production of novel attributive compounds such as *orange-eyed*. Results from this task (consisting of 8 trials per subject) relevant to ruling out an alternative to our analysis will be touched upon below. See Lardiere (1996) for fuller discussion of this second experiment.

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pluralization (that is, a response such as *hands-biter* is not counted as an errorful compound for the purposes of this paper, but see fn. 5 and below). As (6) shows, the rate of errorful compounds is inversely correlated with proficiency level.

(6) *Rate of errorful compounds: all errors* (*exclusive of pluralization errors*)

English level	% of total compounds produced
Low	71.13 (101/142)
Mid	43.09 (78/181)
High	04.21 (8/190)
Total	36.45 (187/513)

Of the errorful compounds, two types of nontargetlike responses will be examined here.[10] The first, which is the more common, involves compounds which exhibit inverted word order, namely, VO, for example, *eater-flies*, *washing-hand* and *kissing-baby mother* (as opposed to *fly-eater*, *hand-washer* and *baby-kissing mother*); we will refer to this as the 'VO error'. The total percentages of compounds the L2ers produced that displayed this VO word order are given in (7). Notice that the VO error virtually disappears at the highest proficiency level. (See Appendix B for the breakdown of VO vs. OV results by individual subject, where it can be seen that all of the intermediate and advanced L2ers meet or exceed a 75% consistency criterion (following Clark et al. 1986; Clark & Barron 1988) for VO/OV word order. Subjects in the low group show more variability; nevertheless, half of these, too, reach the 75% consistency criterion on compounds containing a verb and an object. In total, five (low) subjects show VO/OV variability; five (low and intermediate) subjects consistently produce VO compounds; and the rest consistently produce OV compounds, including all in the advanced group.)

(7) *Rate of VO order inside compounds* (*e.g.* washer-hand(s); wash-hand(s))

English level	% of total compound produced	% of errorful compounds
Low	41.55 (59/142)	58.42 (59/101)
Mid	22.65 (41/181)	52.56 (41/78)
High	00.53 (1/190)	12.50 (1/8)
Total	19.69 (101/513)	54.01 (101/187)

The second type of nontarget response we will discuss involves compounds

[10] Other kinds of errorful compounds were more idiosyncratic and occurred primarily among the lowest group, for example, *mother-hold* ('baby-hugger'), *love-mother* ('baby-hugger'), *hunger-mouses* ('mouse-eater'), *eating-moused* ('mouse-eater'), *dents-painter* ('tooth-painter'), *feets-morder* ('foot-biter'), etc.

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in which the verbal suffix *-ing* appears in contexts obligatorily requiring the (agentive) *-er* suffix instead (for example, *washing-hand*(*s*), or *hand*(*s*)-*washing*, when not accompanied by an overt agent, such as *hand-washing person*), and we will call this the 'ING error'.[11] We will consider the ING error for all compounds, that is, for compounds displaying either VO or OV word order. The rate of ING errors is shown in (8). Again, note that these *-ing* compounds were produced virtually exclusively by subjects in the lower two groups.

(8) *Rate of ING error* (*e.g.* washing-hand(s); hand(s)-washing)

English level	% of total compounds produced	% of errorful compounds
Low	10.56 (15/142)	14.85 (15/101)
Mid	14.92 (27/181)	34.62 (27/78)
High	01.05 (2/190)	25.00 (2/8)
Total	08.58 (44/513)	23.53 (44/187)

[11] The possibility that the *-ing* responses were not deverbal nominals was carefully considered but rejected for the following reasons: First, more than half (54.5%) of the *-ing* compounds produced were preceded by a determiner (*the carrying-baby*, *a flies-eating*, *a painting-tooth*, *the catching-mices*, etc.) In fact, these responses are strongly suggestive of L1 influence, since in Spanish such deverbal compounds resemble VPs but obviously distribute like nouns. Second, in most cases *-ing* responses occurred in apparent free variation with *-er* responses in near-identical contexts, with the informant typically distinguishing, as requested, between describing the activity and naming the agent performing that action. A sample portion below from a transcript easily illustrates these points.

S = Subject 34
I = Interviewer
…
I: OK, what's this one doing?
S: Painting for her tooths.
I: So what could I call her?
S: A tooth-painter.
…
I: And how about this one?
S: He's eating mice.
I: So what could I call him?
S: The mice-eating.
…
S: He's protecting for her sons.
I: OK, so what could I call her?
S: Protector-sons.
…
S: She clean her feets.
I: Mmhmm, so what could I call her?
S: Cleaner-feets. Feets-cleaning. [NB: Only the last, self-corrected response was counted in the data.]
…
S: He following the mouse. It's a mouse-follow.
S: She's kissing the baby, her babies. It's a baby-kissing.

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To summarize, the two main error types reported here were VO word order and the use of a nonagentive verbal affix (*-ing*) in a context which required an agentive one (*-er*). At the most advanced level, both errors essentially disappear. We now turn to analyses of the data, starting with the VO error.

4. Analyses

4.1 *VO error*

Since deverbal compounds in Spanish are VO, the use of VO word order in the Interlanguage compounds might seem to stem from some sort of 'surface transfer', where lexical items from English are merely substituted for the native Spanish. Analyzing the VO data along such lines would predict one of two things: either V[3SG]-O[PL] (such as *washes-hands*), which would be the morpheme-by-morpheme translation from Spanish, or perhaps simply VO (such as *wash-hand*(*s*)), with a bare verb form. However, the L2ers generally do not produce compounds such as *washes-hand*(*s*), such productions occurring only 0.8% of the time. Similarly, compounds with bare verb forms such as *wash-hand*(*s*) are relatively infrequent, comprising only about 6% of total responses (primarily among the lowest group).[12] It appears, then, that a simple surface transfer approach will not suffice to explain the VO error.

Another surface-oriented account of the VO error would be to view these compounds as simple noun-modifier concatenations. One way of testing this idea has been suggested to us by Robert Beard (p.c.): if these compounds were noun-modifier concatenations, then we should also expect, simultaneous to the VO error, the same (nontarget) noun-modifier word order

[12] Bare verbs constitute a total of 21.21% of VO/OV compounds among the low group. The individual breakdown by subject (in ascending order) is as presented below.

Rate of bare verbs in VO/OV compounds (eat-mouse, feet-wash, *etc.*), *low proficiency subjects*

Subject #	% of bare verbs
S23	0 (0/13)
S7	6.67 (1/15)
S11	9.09 (1/11)
S1	12.50 (2/16)
S33	12.50 (2/16)
S22	20.00 (3/15)
S20	25.00 (4/16)
S34	27.27 (3/11)
S5	57.14 (4/7)
S19	66.67 (8/12)

The first seven subjects' responses all meet/exceed the 75% consistency criterion and also significantly differ from chance; the last three subjects' responses fail to meet 75% consistency and also do not differ significantly from chance. The bare stem seems to be the marginally preferred option for only one subject, indicating that even at the lowest proficiency level, the L2ers are attempting to inflect the verb.

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in their sentential syntax (such as *a cookie big*). Again, however, such noun-modifier orders do not characterize their Interlanguage syntax; in fact, results of a separate attributive compounding task administered to the same subjects (see fn. 8) unequivocally demonstrate the acquisition of English modifier-noun order (such as *a big cookie*). Specifically, for the five subjects who consistently produced VO compounds, 35 out of their 40 responses have the adjective preceding the noun (such as *the big red foots person*); in no instance does the adjective follow the noun (the remaining five are non-responses, do not contain an adjective, etc.) (Lardiere 1996).

Moreover, Clark et al. (1986) and Lardiere (1994) found V-*er*-O compounds at an early stage in the L1 acquisition of English synthetic compounds, which is inexplicable if adult compounding is supposed to be a reflection of the canonical modifier-noun order of English sentential syntax. It seems instead that the L1 children posit a temporary analysis where objects are not yet incorporated. (See Lardiere (1994) for further discussion.) Thus, rather than being merely the result of a kind of surface template, the VO word order errors suggest that the L2ers have an intermediate representation in which the verb undergoes nominalization but the object does not incorporate (cf. (5)). Indeed, more careful inspection of their VO compounds provides empirical evidence in favor of such an analysis of the VO error. We turn now to this analysis.

Recall that (7) provides the total rate of VO errors. A closer look at these VO productions shows that they are usually (85–100%) produced with a nominalizing *-er* or *-ing* affix on the verb. The total percentages of compounds exhibiting VO order with the verb marked with *-er* or *-ing* are shown in (9).

(9) *Rate of VO error* (*e.g.* washer-hand(s); washing-hand(s)*: verb affix* -er *or* -ing

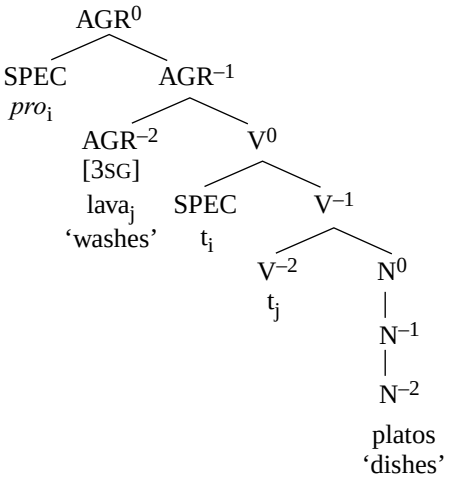
English level	% of total compounds produced	% of errorful compounds
Low	35.21 (50/142)	49.50 (50/101)
Mid	21.00 (38/181)	48.72 (38/78)
High	00.53 (1/190)	12.50 (1/8)
Total	17.35 (89/513)	47.59 (89/187)

The fact that the VO word order is usually accompanied by either *-er* or *-ing* attached to the verb seems to demand some other, less 'surfacy' analysis – yet one that does indeed acknowledge the influence of the L1 grammar. The question is: why do the L2ers produce the nominalizing *-er* or *-ing* affix on the verb in conjunction with the VO word order?

To answer this question, we need to consider again the representation of deverbal compounding in Spanish shown earlier in (3), repeated in (10).

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(10) *Spanish deverbal compound*

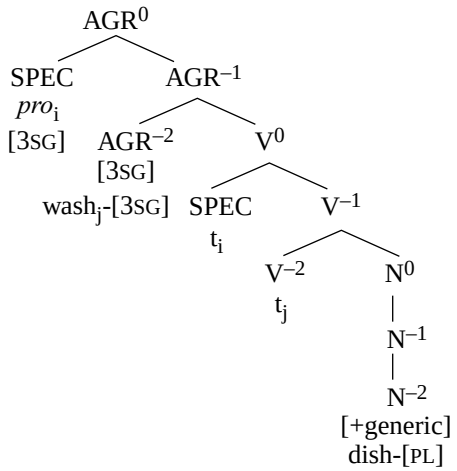


lavaplatos ('dishwasher')

Spanish speakers' knowledge of their L1 could lead them to assume that like deverbal compounds in their own language, English deverbal *-er* and *-ing* compounds are headed by (deverbal) AGR^{-2}. Part of the representation of AGR in Spanish compounds (as well as *-er* and gerund *-ing* in English compounds) must include agreement features such as [3SG]. In those cases where Spanish speakers produce V-*er*/*-ing* + N compounds (such as *washer-dish*(*es*)/*washing-hand*(*s*)), it is hypothesized that the AGR^{-2} head of the L1 Spanish structure – with its [3SG] features – is present, active, and still licenses *pro* as the external argument if the verb raises up to it. Thus the analysis we propose for these compounds is the (X^0-level) syntactic structure as in (11), illustrated with *washer-dishes*.

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(11) *Interlanguage representation: VO error*

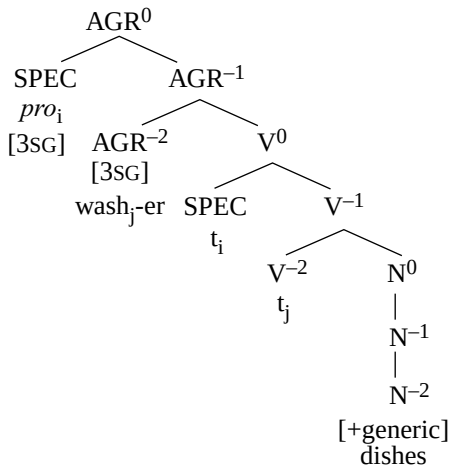


We suggest that these L2ers assume that *-er* and *-ing* in English are the phonological spell-out of [3SG] in the deverbal compounding process (input would be evidence of this). The crux of our analysis at this point is that as a carry-over from the L1 grammar, the [3SG] features in AGR^{-2} license (and identify) the external argument *pro*, via Spec-Head agreement after verb raising. The features [3SG] are realized as either the affix *-er* or *-ing*. (The reason the features have this spell-out is an issue to which we return in section 4.2.) This analysis will account for the clearly deverbal status of the resulting word, the production of the VO word order, and the use of the *-er* and *-ing* affixes attached to the verb.[13] Thus after the mapping from syntactic features to (morpho)phonological forms is complete, the resulting X^0-level word would look as in (12).

[13] Contrary to the speculation of one referee, our position does not predict that *-er* or *-ing* will be found attached to verbs in finite sentences (as in *The man go-er home* as opposed to *The man goes home*). We explicitly state that the affixes chosen for deverbal compounds (which contain no tense feature, for example) are nominalizing affixes; we would not predict the use of nominalizing inflection on verbs in finite, tensed clauses. (See also below for parallel reasoning as to why non-nominalizing affixes are predicted not to occur within their deverbal compounds.)

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(12)



In short, our claim is that there is 'full transfer' of the properties of the L1 grammar (Schwartz & Sprouse 1994, 1996); due to these L1 properties, the L2ers seem to be looking for a way to spell out [3SG], and *-er* and *-ing* are selected. Note that entailed in our analysis is the presence of an agreement relation within the AGR^0 node, between the features in AGR^{-2} and the *pro* in [Spec, AGR^0]. In other words, we propose that syntactic agreement in early stages of L2 acquisition exists despite (or rather due to) the mismatch with the target deverbal compound.

An alternative to this analysis is one which relies on *-er*/*-ing* lowering (covert verb movement – see fn. 3); this would seem to result in the same V-*er*/*-ing* O pattern. There are, however, arguments to disfavor such an analysis when the description of the V-*er*/*-ing* O errors is considered more fully. A comparison with the L1 development of English deverbal compounding should prove helpful.

Early on, English L1 acquirers also produce deverbal compounds with VO word order, but these errors are crucially different from the L2ers' VO error: in L1 acquisition, the object is virtually never pluralized (Clark et al. 1986), unlike the L2 VO errors which tend to have pluralized objects (Lardiere 1994). It seems, then, that the two VO error patterns should not be attributed the same etiology, and again, that the prevalence of object pluralization in the L2 VO error easily receives an explanation from L1 influence, since such objects in Spanish V-N compounds are plural. To discount L1 influence in regard to verb raising but retain it in regard to object pluralization seems implausible, for this would amount to a completely unprincipled (and ad hoc) approach to L1 influence. Hence, if L2ers do, by hypothesis, start off with their L1 representation of deverbal compounds, then, in view of the alternative *-er*/*-ing* lowering analysis, the learnability question becomes: what in the input would lead the L2er to relinquish verb raising in favor of

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positing *-er/-ing* lowering instead? As far as we can tell, nothing: nothing in deverbal compound input would force the L2er to give up verb raising. The L2 learnability situation in the acquisition of deverbal compounding in English is, in sum, distinct from its L1 counterpart (where learnability considerations do plausibly lead to analyzing the VO error as *-er/-ing* lowering without object incorporation). Hence the L1 acquisition rationale for positing *-er/-ing* lowering is also not necessarily applicable to the L2 acquisition context. By contrast, our analysis does not suffer either from an unprincipled approach to L1 influence or from a learnability dilemma.

A second problem with an *-er/-ing* lowering analysis concerns the empty category in [Spec, AGR^0]. Under such an analysis it could not be *pro*, since *pro* is licensed via Spec-Head agreement within AGR^0, and without verb raising this would not obtain. Thus, our claim is that *pro* continues to exist in the Interlanguage representation of deverbal compounding, whereas a lowering analysis would have to maintain the opposite. Is there, in principle, an empirical way to decide? One way to test whether *pro* is indeed employed in deverbal compounding at this stage is to determine whether *pro* is also still used in sentential syntax. Studies on the L2 acquisition of English by native Spanish speakers (see White 1985, for example) are highly suggestive in this regard: missing subjects is a property that characterizes their L2 English, particularly at nonadvanced stages.[14]

Finally, we should also underscore that another, perfectly feasible error is virtually nonexistent in our data: the L2ers do not produce compounds like *chase-micer* where the *-er* is attached to the entire VP rather than just to the verb, even though they hear *-er* as the last (linear) element of the compound in the input. This absence in light of their production of errors like *chaser-mice* also points to the conclusion that the L2ers are indeed attempting to 'inflect' the verb, as we have argued above. And again, the analysis we propose, where the representation in full from the Spanish L1 serves as the L2ers' starting point, predicts the nonoccurrence of this error, accounting for the VO error that occurs among subjects in the two nonadvanced levels.

At the advanced level, as previously noted, the VO error essentially disappears. However, even at this stage, the effects of L1 transfer may be observed, namely in the persistently high rate of pluralization of objects in the compounds (such as *hands-washer*). Even at the advanced level, the rate of pluralized objects in otherwise correctly formed compounds is 52.2%,

[14] Notice that a similar test, in principle, could be deployed in regard to the issue of verb raising within the compound (see above): do nonadvanced L1-Spanish, English L2ers continue to have verb raising in sentential syntax? Unfortunately, we are not aware of Spanish-English Interlanguage studies relevant to this question, although the well-known research on French acquirers of English (White 1990/1991, 1991, 1992) is also suggestive: (partial) verb raising (past adverbs) is not relinquished. We would therefore predict that the same would be found in Spanish acquirers of English.

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suggesting that object incorporation into the nominalized verb has still not been acquired.[15]

In other words, to some extent even advanced subjects appear to be still relying on the representation from their L1, in which the generic feature of the object in Spanish deverbal compounds is spelled out as plural. Although the L2ers appear to have added leftward object movement, we propose that this movement is adjunction, rather than incorporation, yielding the representation in (13).

---

[15] The 52.2% pluralization rate encompasses objects that are regularly pluralized (*hand-hands*) as well as irregularly pluralized (*foot-feet*). If we conservatively consider only regular plurals (as only these are uncontroversially deviant from native norms), the object pluralization rate in otherwise correct compounds among the advanced group is 33.33%. The individual breakdown of such regular pluralization for the advanced subjects is presented below (in ascending order).

Rate of regular pluralization of objects in otherwise correct compounds (*e.g.* insects-catcher), *advanced proficiency subjects*

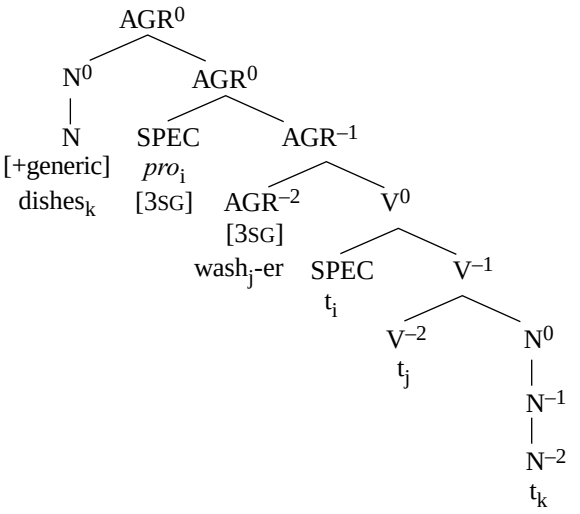
Subject #	% regular pluralization of objects
S21	09.09 (1/11)
S16	10.00 (1/10)
S17	12.50 (1/8)
S4	14.29 (1/7)
S15	14.29 (1/7)
S18	14.29 (1/7)
S31	40.00 (2/5)
S14	50.00 (4/8)
S29	50.00 (3/6)
S27	62.50 (5/8)
S32	66.67 (6/9)
S10	71.43 (5/7)

The first six subjects' responses meet/exceed the 75% consistency criterion (only S21 and S16 meet/exceed 90%); the last six subjects' responses fail to meet 75% consistency and therefore unambiguously show that they have not acquired the target English representation.

Note, finally, that these findings are in marked contrast to results reported for English L1 acquisition (Gordon 1985; Clark et al. 1986) where virtually no regular pluralization in productive compounding occurs. This fact points to the untenability of a referee's proposal that the object pluralization errors derive from generics in English, which are also realized by plural affixation (as in *He fixes televisions*). If, for these adult L2 acquirers, it were the English realization of generics as plural which led them to pluralize the object, then one would expect L1 children to likewise be misled – but they are not. Again, our account based on a holdover of L1 influence from the beginning neatly captures the L2 data as well as this difference between the L2 and the L1 data.

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(13)



Motivation – albeit somewhat indirect – for positing such adjunction comes from two sources: analyses of native and nonnative acquisition of sentential syntax. Roeper (1992) (following Lebeaux 1990; Tavakolian 1981) and Hoekstra & Jordens (1994) have argued that the process of adjunction is an essential component in the creation of L1 grammars; their idea is that in the construction of the architecture of the grammar, lexical elements that cannot be reconciled into the pre-existing structure always first adjoin to it. Roeper puts forward this claim in relation to the clause, and Hoekstra & Jordens in relation to both clausal and nominal structures. Schwartz & Sprouse (1994) have argued that this same process of adjunction is in evidence in the L2 acquisition of syntax (their example also relates to clause structure). What we're suggesting here is to extend this hypothesis into lexical derivation. This is in keeping with the assumptions of the rest of this paper in generalizing the operations and constraints of syntax to complex word-formation wherever possible. In short, at this stage the L2ers must find a way to accommodate input (namely OV deverbal compound input) irreconcilable with the structures generated by their L1 grammar; rather than restructure their existing grammar, they instead first add the (UG-sanctioned) adjunction operation, which results in the targetlike OV order.

4.2 *ING errors*

We now turn to the other type of error discussed above, namely, compounds in which the verb is marked with *-ing* rather than the required (agentive) affix *-er* (for example, *washing-hand*(*s*) or *hand*(*s*)*-washing*). The rate of this error

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out of total compounds produced and as a percentage of errorful compounds was provided in (8), which we repeat below as (14).

(14) *Rate of ING error* (*e.g.* washing-hand(s); hand(s)-washing)

English level	% of total compounds produced	% of errorful compounds
Low	10.56 (15/142)	14.85 (15/101)
Mid	14.92 (27/181)	34.62 (27/78)
High	01.05 (2/190)	25.00 (2/8)
Total	08.58 (44/513)	23.53 (44/187)

Although nontargetlike in the context of the task (which required an agent to be mentioned), *-ing* affixation is of course a possible nominalizing device for English synthetic compounding (i.e. in gerund compounds), and like *-er* compounds, also results in a 3SG deverbal nominalization. We think that this result is significant. Out of the many conceivable errors that could have been produced, the most common errors were restricted to verbs marked with *-er* and *-ing* affixes.

We would like to argue that the restriction on the form of the affix produced is not arbitrary. To do so we turn for support to much recent work in morphology which posits a clear distinction between feature assignment in the syntax and the (post-syntactic) phonological realization of those features as particular affixes. Several major proposals, such as the lexeme-based theories of Anderson (1992), Aronoff (1994) and Beard (1987, 1993, 1995), and the Distributed Morphology model of Halle & Marantz (1993), have all converged on the view that the creation of complex syntactic heads is defined with respect to features only, rather than actual morphemes. While these proposals individuate themselves in several respects, they all in some sense follow what's known as the SEPARATION HYPOTHESIS (Beard 1987) in taking what is traditionally considered the grammatical morpheme and separating its (morphosyntactic/semantic) features, specified by UG, from its language-specific phonological form(s).

Our analysis of the ING errors (and for that matter, the V *-er* O errors) makes use of the insights of these 'separation based' models of morphology. We hypothesize that the L2 acquirers use whatever spell-out is available in their productive repertoire at any given stage to encode the morphosyntactic features of their representation. The particular affix they choose need only represent features which are COMPATIBLE with those required by the feature matrix, and therefore may be overgeneral until further differentiation has been acquired. This point has been made in regard to final-state grammars, for example, by Halle & Marantz (1993: 121–122), who describe a kind of search procedure among possibly competing affixes (they refer to these affixes as 'Vocabulary' items):

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> [The feature complexes of terminal nodes] are not necessarily identical with the feature complexes of actually occurring Vocabulary items of the language. …[T]he Vocabulary item that matches the most features of the node will be inserted. Vocabulary items may therefore be underspecified for the morphosyntactic feature complexes that they realize.

We hypothesize that L1 influence initially obviates the need to MORPHOLOGICALLY encode the (agentive) external argument, which, though overtly required and expressed as *-er* in English deverbal compounds, remains *pro* (and hence phonetically null), as in the Spanish deverbal compound (see (3)). From this L1 vantage point, the ING errors, which appear to lack an external argument, may in fact be perceived by the L2ers as the direct counterpart to the Spanish compound: *-ing* alone (i.e. without an overt agent) works perfectly well in instantiating the features [3SG] and [nominal]. Thus at an early-to-intermediate stage of the subjects' English development, *-ing* may either supplant or compete with *-er*, since at this stage the affix need only spell out the features [3SG] and [nominal]. Note that such an interpretation of the *-ing* errors thus also provides an additional reason for an analysis which posits *pro* in the L2ers' early representations of English deverbal compounds.

In sum, consistent with the analysis proposed in Section 4.1 for the initial instantiation of the L1 representation of deverbal compounding in the L2ers' Interlanguage compounds, this use of 'separation based' models of morphology explains the overt appearance of *-ing* and *-er*. In so far as the two are, at this point in development, merely the spell-out of the deverbal [3SG] features of AGR^{-2} (as transferred from the L1), *-ing* and *-er* compete as possible affixes.

Note that this type of proposal is falsifiable: it predicts, with respect to particular complexes of features, that only certain morphological spell-outs will be at all possible and that all others will be impossible. So, for example, in the deverbal compound case, one would not expect anything other than forms corresponding to deverbalizing affixes (for example, **-tious*, because the features of the terminal node would be distinct from the features of the suffix *-tious*) (see also fn. 4). Notice, furthermore, that a feature such as '[attaches to verbs]' – a referee's suggestion – is insufficient; this feature on its own would not exclude other possible affixes, such as past tense *-ed* or [3SG] *-s*. Unlike *-er* and *-ing*, these affixes are incompatible with nominal AGR^{0}, and as we would predict, they are virtually never found. Rather, as we have seen, the spell-outs in the L2 compound data are largely confined to *-er* and *-ing*.

Finally, one can see strikingly similar evidence of 'wrong' affixation encoding precisely the right agreement feature-marking in L1 acquisition as well. Clahsen (1990/1991: 377, (12)) and Clahsen & Penke (1992: 188, (4)), for example, report the following error in German L1 data, in which an

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apparent 3SG 'pronominal copy' *er* ('he') affixed to the verb occurs, instead of the 3SG target form *ist* (or more colloquially, *is*) ('is'):

(15) (a) fels noch nich is-er putt — D (2;10)
rock yet not is-he broke
'The rock is not yet broken'

(b) das is-er fest — D (2;10)
that is-he fixed
'This is fixed'

(c) da is-er großer fisch — D (age not provided)
there is-he big fish
'There is a big fish'

Clahsen (1990/1991) uses this mismatch with the target verb form to argue that rather than a full-fledged AGR projection, the child has at this point posited an underspecified functional projection which 'in contrast to the adult language … does not involve [subject-] verb agreement' (p. 382; see also Clahsen & Penke 1992: 210). Rather than saying that the AGR projection is not yet available, we are inclined to interpret this 'error' as evidence for agreement and as additional support for our analysis: while *er* is not a verbal affix in the target system, it is specified for [3SG] (and [MASC]). In other words, the *is-er* data show an attempt to spell out the grammatical features associated with a syntactic node (AGR), implicated in a Spec-Head (subject-verb) agreement relation (inside AGRP).

5. Conclusion

In this paper we have argued that the appearance of nontargetlike affixation by language acquirers should not be used as a criterion for assuming the nonexistence of syntactic relations like agreement. Furthermore, in so far as agreement is a relation that implicates functional categories and their projections, the absence of the correct phonological forms associated with these functional heads cannot be taken to imply the absence of the corresponding phrase structure in the syntax.

It is important to note that we are not contesting the well-accepted idea that the presence of targetlike affixes, consistently and appropriately used, does indicate knowledge of the requisite underlying features (although see Smith & Tsimpli 1995: 25). However, beginning with the L2 morpheme-order studies of Dulay & Burt (1974), errors or omissions among affixes in obligatory contexts has often been essentially equated with LACK of knowledge. This assumption has continued to be implicitly or explicitly upheld in the methodology of more recent work in L2 acquisition (for

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example, Clahsen 1988; Hilles 1991; Lakshmanan 1991; Meisel 1991; Eubank 1994; Vainikka & Young-Scholten 1994). Although Eubank (1993/1994) argues – quite reasonably, we think – against the L1 transfer of actual affixes (Weinreich 1953), in so doing he nonetheless equates these affixes with the morphosyntactic features they encode; he furthermore suggests that the absence of such transfer indicates the apparent non-transferability of KNOWLEDGE associated with those features. It is this latter assumption we are contesting. We have suggested that it may be premature to conclude on the basis of nontargetlike morphological spell-out that there is a lack of knowledge of the features in question; in fact, on the contrary, we have shown examples in which L2ers produce affixes consistent with the L1 features, thereby indicating knowledge of these features.[16]

Our empirical evidence came primarily from an experiment in which L2 acquirers produced deverbal compounds in English: the subset of errorful compounds we focused on, the V-*er*-O, V-*ing*-O and OV-*ing* compounds, all support the idea that the L2ers are trying to spell out the features associated with the head of the deverbal compound; once one separates the morphosyntactic features of a representation from the (post-syntactic) spell-out of those features as affixes, these errors receive a plausible explanation. Our account crucially relies on the initial 'transfer' of the L1 Spanish representation of deverbal compounds, in line with the Full Transfer/Full Access model (Schwartz & Sprouse 1994, 1996), in which the L1 features are specified from the beginning (contra Eubank 1993/1994); the errors result from spelling out these L1-specified features with English affixes with which they are compatible. Other more surface-oriented explanations of the errors, particularly the VO word order error, were shown to be inadequate.

It is uncontroversial that the phonological forms which encode morphosyntactic/semantic features have to be learned in relation to the terminal syntactic nodes with which they are associated; this must be so because they are language-particular. It is therefore possible that certain nodes may well be present in early grammatical representations – with the target specification of features – and still not be realized as in the target language. It is perhaps

[16] Consider Roeper's (1992: 349–50) observations on this issue:

> [I]t is important to distinguish between an abstract notion of an Agreement affix and the lexical features of agreement. The central contrast is between presence or absence of an affix. If a child consistently has an affix, any affix, then we can argue that the principle of agreement is present at that point. Learning to make correct agreement between affixes and the full range of Phi-features requires extensive learning.

[17] In regard to the use of 3SG *-s* in her study of the acquisition of English by French-speaking children, White (1992: 281) remarks: 'if [they] show evidence of using a category, although not using it correctly all the time, it suggests that the category in question has emerged … and that other factors are responsible for its not being consistently used'. We would concur with this conclusion.

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the further specification of features for particular phonological affixes which is especially troublesome to L2 acquirers.[17] While we recognize that this seems to shift the 'blame' from syntax to some unspecified feature-construction process in the morphology component, it may nonetheless be on the right track.

Departing from more traditional approaches, in sum, we reported on and analyzed data which provide a basis for an alternative research strategy: the specific type of spell-out errors have been taken as evidence for a syntactic agreement relation (at the word-level); and in so far as this agreement relation implicates the existence of AGR^0, the data furthermore lend support to models of nonnative language acquisition which claim that functional-category nodes – specified for the appropriate features – do indeed exist in the early stages of the Interlanguage, carried over from the L1 grammar.

APPENDIX A



Toe-painter

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APPENDIX B

Compound word order for individual subjects, grouped by L(ow), I(ntermediate) and A(dvanced) proficiency levels.

Low				Intermediate				Advanced			
S#	VO	OV	Other*	S#	VO	OV	Other	S#	VO	OV	Other
L1	6	10	0	I1	4	12	0	A1	0	16	0
L2	2	5	9	I2	0	16	0	A2	0	16	0
L3	7	8	1	I3	9	1	6	A3	0	16	0
L4	6	5	5	I4	0	16	0	A4	0	16	0
L5	2	7	7	I5	2	10	4	A5	0	16	0
L6	4	12	0	I6	1	14	1	A6	0	15	1
L7	15	0	1	I7	1	14	1	A7	0	14	2
L8	0	13	3	I8	11	3	2	A8	0	16	0
L9	14	2	0	I9	0	15	1	A9	0	16	0
L10	3	10	3	I10	0	15	1	A10	0	16	0
				I11	1	6	9	A11	1	13	2
				I12	12	4	0	A12	0	16	0

* Other = Indicates compounds for which verb-object order could not be determined (usually due to the compounding of an agent rather than the object, as in *teacher-counter, holder-mother*), or if the response was not counted as a compound (e.g. *painter, mother, kisser of baby, kind father*) or in cases of no response or 'I don't know' responses. For each subject, a total of 16 compounds was possible.

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